Changes for the Better

MITSUBISHI ELECTRIC

Air-Conditioners For Building Application

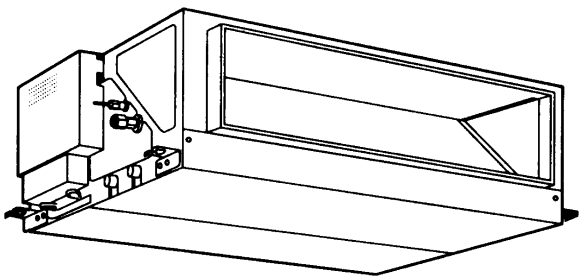
2005

TECHNICAL & SERVICE MANUAL

Series PEFY Ceiling Concealed

<Indoor unit>

Models **PEFY-P15NMHU-E,PEFY-P18NMHU-E**
PEFY-P24NMHU-E,PEFY-P27NMHU-E
PEFY-P30NMHU-E,PEFY-P36NMHU-E
PEFY-P48NMHU-E,PEFY-P54NMHU-E
PEFY-P72NMHU-E,PEFY-P96NMHU-E



INDOOR UNIT

CONTENTS

SAFETY PRECAUTIONS ····1
1. FEATURES ····3
2. PART NAMES AND FUNCTIONS ····4
3. SPECIFICATION ····6
4. OUTLINES AND DIMENSIONS ····8
5. WIRING DIAGRAM ····10
6. REFRIGERANT SYSTEM DIAGRAM ····12
7. TROUBLE SHOOTING ····13
8. DISASSEMBLY PROCEDURE ····16

CITY MULTI

For use with the R410A & R22

SAFETY PRECAUTIONS

1. Before installation and electric work

- **Before installing the unit, make sure you read all the "Safety precautions".**
- **The "Safety precautions" provide very important points regarding safety. Make sure you follow them.**
- **This equipment may cause the adverse effect on the same supply system.**
- **Please report to or take consent by the supply authority before connection to the system.**

Symbols used in the text

⚠Warning:
Describes precautions that should be observed to prevent danger of injury or death to the user.

⚠Caution:
Describes precautions that should be observed to prevent damage to the unit.

Symbols used in the illustrations

: Indicates an action that must be avoided.

: Indicates that important instructions must be followed.

: Indicates a part which must be grounded.

: Indicates that caution should be taken with rotating parts. (This symbol is displayed on the main unit label.) <Color: Yellow>

: Beware of electric shock (This symbol is displayed on the main unit label.) <Color: Yellow>

⚠Warning:
Carefully read the labels affixed to the main unit.

⚠Warning:

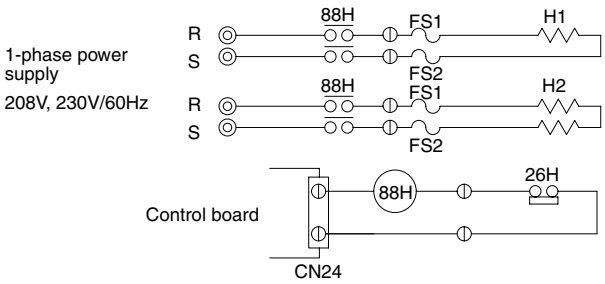
- **Ask the dealer or an authorized technician to install the air conditioner.**
  - Improper installation by the user may result in water leakage, electric shock, or fire.
- **Install the air unit at a place that can withstand its weight.**
  - Inadequate strength may cause the unit to fall down, resulting in injuries.
- **Use the specified cables for wiring. Make the connections securely so that the outside force of the cable is not applied to the terminals.**
  - Inadequate connection and fastening may generate heat and cause a fire.
- **Prepare for typhoons and other strong winds and earthquakes and install the unit at the specified place.**
  - Improper installation may cause the unit to topple and result in injury.
- **Always use an air cleaner, humidifier, electric heater, and other accessories specified by Mitsubishi Electric.**
  - Ask an authorized technician to install the accessories. Improper installation by the user may result in water leakage, electric shock, or fire.
- **Never repair the unit. If the air conditioner must be repaired, consult the dealer.**
  - If the unit is repaired improperly, water leakage, electric shock, or fire may result.
- **Do not touch the heat exchanger fins.**
  - Improper handling may result in injury.
- **If refrigerant gas leaks during installation work, ventilate the room.**
  - If the refrigerant gas comes into contact with a flame, poisonous gases will be released.
- **Install the air conditioner according to this Installation Manual.**
  - If the unit is installed improperly, water leakage, electric shock, or fire may result.
- **Have all electric work done by a licensed electrician according to "Electric Facility Engineering Standard" and "Interior Wire Regulations"and the instructions given in this manual and always use a special circuit.**
  - If the power source capacity is inadequate or electric work is performed improperly, electric shock and fire may result.
- **Keep the electric parts away from water (washing water etc.).**
  - It might result in electric shock, catching fire or smoke.
- **Securely install the cover of control box and the panel.**
  - If the cover and panel are not installed properly,dust or water may enter the outdoor unit and fire or electric shock may result.
- **When installing and moving the air conditioner to another site, do not charge the it with a refrigerant different from the refrigerant specified on the unit.**
  - If a different refrigerant or air is mixed with the original refrigerant, the refrigerant cycle may malfunction and the unit may be damaged.
- **If the air conditioner is installed in a small room, measures must be taken to prevent the refrigerant concentration from exceeding the safety limit even if the refrigerant should leak.**
  - Consult the dealer regarding the appropriate measures to prevent the safety limit from being exceeded. Should the refrigerant leak and cause the safety limit to be exceeded, hazards due to lack of oxygen in the room could result.
- **When moving and reinstalling the air conditioner, consult the dealer or an authorized technician.**
  - If the air conditioner is installed improperly, water leakage, electric shock, or fire may result.
- **After completing installation work, make sure that refrigerant gas is not leaking.**
  - If the refrigerant gas leaks and is exposed to a fan heater, stove, oven, or other heat source, it may generate noxious gases.
- **Do not reconstruct or change the settings of the protection devices.**
  - If the pressure switch, thermal switch, or other protection device is shorted and operated forcibly, or parts other than those specified by Mitsubishi Electric are used, fire or explosion may result.
- **To dispose of this product, consult your dealer.**
- **Do not use a leak detection additive.**

⚠ Warning:

- **Note the following when building a heater in the air conditioning system.**
  - Leave enough space between units for proper ventilation so that the indoor unit temperature does not exceed 40˚C when windless.
  - Keep the heater clean, and take appropriate measures so that the indoor unit does not suck in the dust particles that accumulate on the heater.
  - Use the optional heater cable (PAC-YU24HT) to perform an interlocked operation with indoor units.
  - Do not build a heater inside the indoor unit.

Recommended circuit

Wiring diagram



FS1, 2 ----- Thermal fuse
H1, H2 ----- Heater
26H --------- Overheat protection thermostat
88H --------- Electromagnetic contactor

2. Precautions for devices that use R410A refrigerant

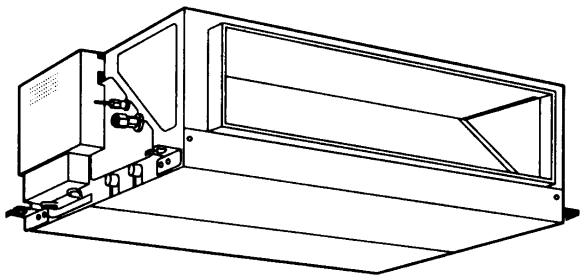
⚠ Caution:

- **Do not use the existing refrigerant piping.**
  - The old refrigerant and refrigerator oil in the existing piping contains a large amount of chlorine which may cause the refrigerator oil of the new unit to deteriorate.
- **Use refrigerant piping made of C1220 (Cu-DHP) phosphorus deoxidized copper as specified in the *JIS H3300 "Copper and copper alloy seamless pipes and tubes". In addition, be sure that the inner and outer surfaces of the pipes are clean and free of hazardous sulphur, oxides, dust/dirt, shaving particles, oils, moisture, or any other contaminant.**
  - Contaminants on the inside of the refrigerant piping may cause the refrigerant residual oil to deteriorate.

  *JIS: Japanese Industrial Standard
- **Store the piping to be used during installation indoors and keep both ends of the piping sealed until just before brazing. (Store elbows and other joints in a plastic bag.)**
  - If dust, dirt, or water enters the refrigerant cycle, deterioration of the oil and compressor trouble may result.
- **Use ester oil, ether oil or alkylbenzene (small amount) as the refrigerator oil to coat flares and flange connections.**
  - The refrigerator oil will degrade if it is mixed with a large amount of mineral oil.
- **Use liquid refrigerant to fill the system.**
  - If gas refrigerant is used to seal the system, the composition of the refrigerant in the cylinder will change and performance may drop.
- **Do not use a refrigerant other than R410A.**
  - If another refrigerant (R22, etc.) is used, the chlorine in the refrigerant may cause the refrigerator oil to deteriorate.
- **Use a vacuum pump with a reverse flow check valve.**
  - The vacuum pump oil may flow back into the refrigerant cycle and cause the refrigerator oil to deteriorate.
- **Do not use the following tools that are used with conventional refrigerants.**
  (Gauge manifold, charge hose, gas leak detector, reverse flow check valve, refrigerant charge base, vacuum gauge, refrigerant recovery equipment)
  - If the conventional refrigerant and refrigerator oil are mixed in the R410A , the refrigerant may deteriorated.
  - If water is mixed in the R410A , the refrigerator oil may deteriorate.
  - Since R410A does not contain any chlorine, gas leak detectors for conventional refrigerants will not react to it.
- **Do not use a charging cylinder.**
  - Using a charging cylinder may cause the refrigerant to deteriorate.
- **Be especially careful when managing the tools.**
  - If dust, dirt, or water gets in the refrigerant cycle, the refrigerant may deteriorate.

1 FEATURES

Series PEFY Ceiling Concealed

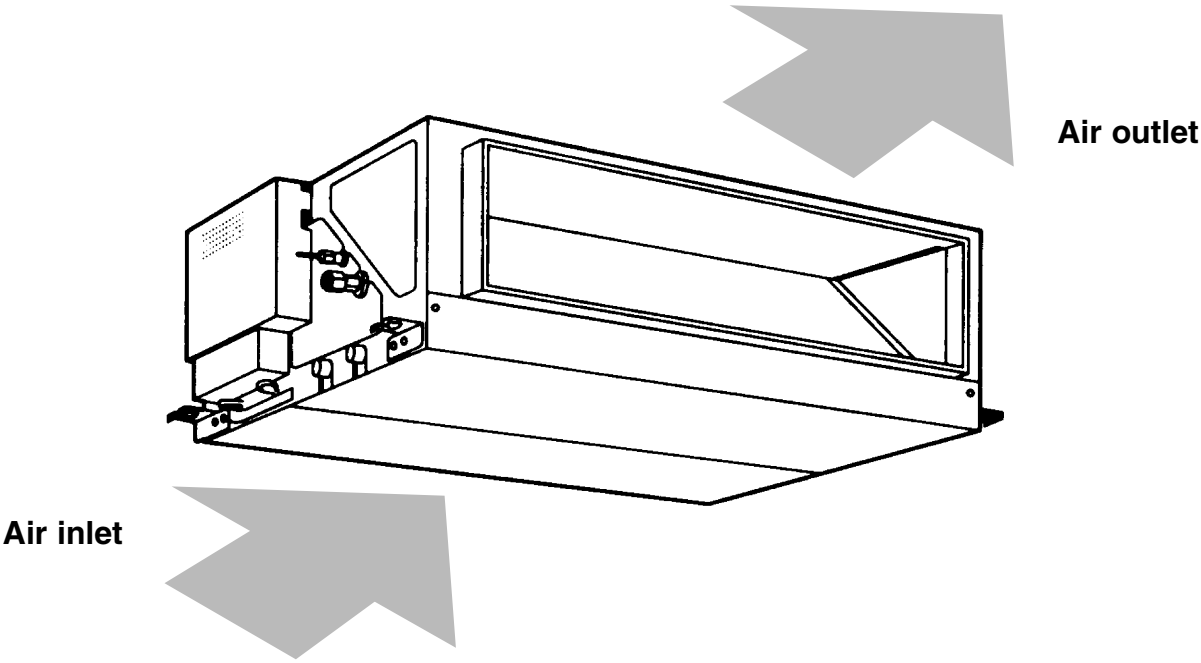


Indoor unit

Models	Cooling capacity/Heating capacity	
	kW	BTU / h
PEFY-P15NMHU-E	4.4 / 5.0	15000 / 17000
PEFY-P18NMHU-E	5.3 / 5.9	18000 / 20000
PEFY-P24NMHU-E	7.0 / 7.9	24000 / 27000
PEFY-P27NMHU-E	7.9 / 8.8	27000 / 30000
PEFY-P30NMHU-E	8.8 / 10.0	30000 / 34000
PEFY-P36NMHU-E	10.6 / 11.7	36000 / 40000
PEFY-P48NMHU-E	14.1 / 15.8	48000 / 54000
PEFY-P54NMHU-E	15.8 / 17.6	54000 / 60000
PEFY-P72NMHU-E	21.1 / 23.4	72000 / 80000
PEFY-P96NMHU-E	28.1 / 31.7	96000 / 108000

2 PART NAMES AND FUNCTIONS

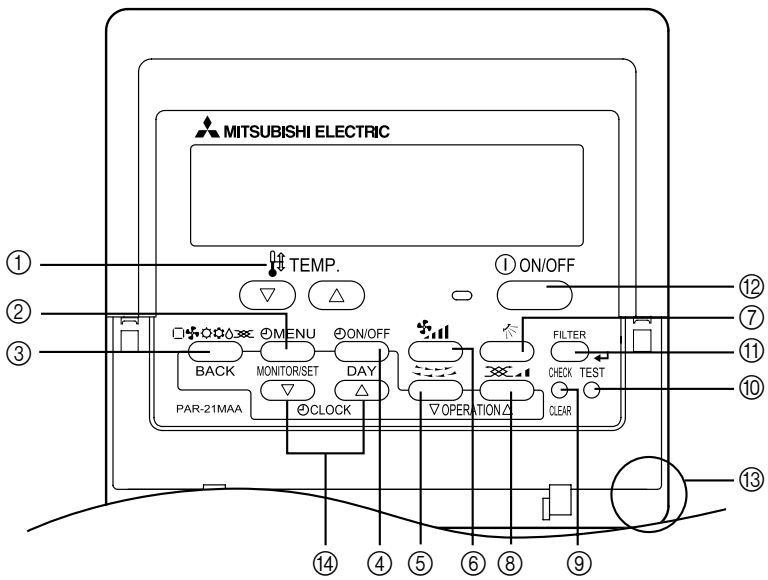
● **Indoor (Main) Unit**



● **Remote controller** **[PAR-21MAA]**

● Once the controls are set, the same operation mode can be repeated by simply pressing the ON/OFF button.

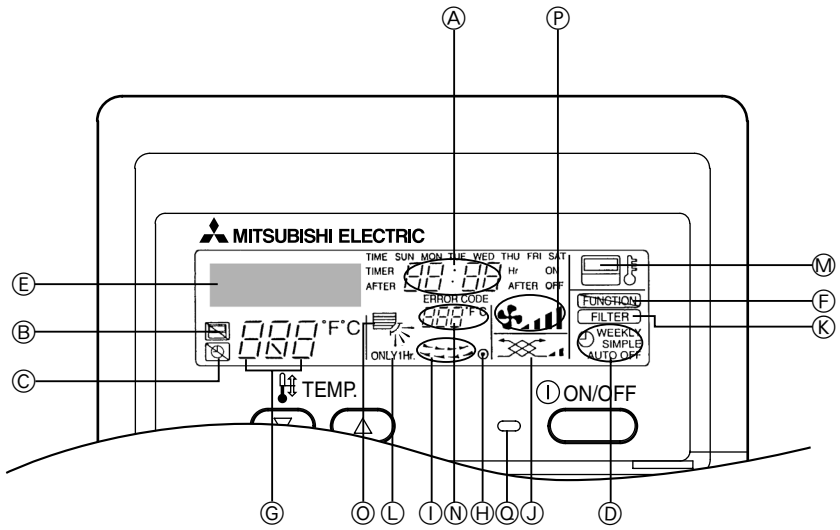
[Operation buttons]



① [Set Temperature] Button
② [Timer Menu] Button
[Monitor/Set] Button
③ [Mode] Button
[Return] Button
④ [Timer On/Off] Button
[Set Day] Button
⑤ [Louver] Button
[Operation] Button
⑥ [Fan Speed] Button
⑦ [Airflow Up/Down] Button
⑧ [Ventilation] Button
[Operation] Button
⑨ [Check/Clear] Button
⑩ [Test run] Button
⑪ [Filter] Button
[↵] Button
⑫ [ON/OFF] Button
⑬ Position of built-in room temperature
⑭ [Set Time] Button

- Never expose the remote controller to direct sunlight. Doing so can result in the erroneous measurement of room temperature.
- Never place any obstacle around the lower right-hand section of the remote controller. Doing so can result in the erroneous measurement of room temperature.

[Display]



Ⓐ Current time/Timer
Ⓑ Centralized control
Ⓒ Timer OFF
Ⓓ Timer indicator
Ⓔ Operation mode: ☼COOL, ♢DRY, ▭AUTO, ✣FAN, ☼HEAT
Ⓕ “Locked” indicator
Ⓖ Set temperature
Ⓗ Power ON
Ⓘ Louver
Ⓙ Ventilation
Ⓚ Filter sign
Ⓛ Set effective for 1 hr.
Ⓜ Sensor position
Ⓝ Room temperature
Ⓞ Airflow
Ⓟ Fan speed

3 SPECIFICATION

3-1. Specification

PEFY-P-NMHU-E

Item \ Model				PEFY-P15NMHU-E	PEFY-P18NMHU-E	PEFY-P24NMHU-E	PEFY-P27NMHU-E	PEFY-P30NMHU-E
Power sourse				208/230V, 60Hz				
Capacity *1	Cooling	kW		4.4	5.3	7.0	7.9	8.8
		BTU/h		15000	18000	24000	27000	30000
	Heating	kW		5.0	5.9	7.9	8.8	10.0
		BTU/h		17000	20000	27000	30000	34000
Dimension	Height	mm		380				
		in		14-31/32				
	Width	mm		750			1000	
		in		29-17/32			39-3/8	
	Depth	mm		900				
		in		35-7/16				
Net weight		kg		44		45	50	
		lb		98		100	111	
FAN	Airflow rate (Low-High)		m^3/min	10.0-14.0	10.0-14.0	13.5-19.0	15.5-22.0	18.0-25.0
			cfm	353-494	353-494	477-671	547-777	636-883
	External static pressure *3	Pa	208V	N/A -50-160	N/A -50-160	N/A -50-160	N/A -50-160	N/A -50-160
			230V	100-150-200	100-150-200	100-150-200	100-150-200	100-150-200
Noise level (Low-High) *2		dB(A)	208V	25-32	25-32	29-36	30-38	33-40
			230V	34-39	34-39	36-41	35-41	38-43
Filter				Standard filter				

PEFY-P-NMHU-E

Item \ Model				PEFY-P36NMHU-E	PEFY-P48NMHU-E	PEFY-P54NMHU-E	PEFY-P72NMHU-E	PEFY-P96NMHU-E
Power sourse				208/230V, 60Hz				
Capacity *1	Cooling	kW		10.6	14.1	15.8	21.1	28.1
		BTU/h		36000	48000	54000	72000	96000
	Heating	kW		11.7	15.8	17.6	23.4	31.7
		BTU/h		40000	54000	60000	80000	108000
Dimension	Height	mm		380			470	
		in		14-31/32			18-17/32	
	Width	mm		1200			1250	
		in		47-1/4			49-7/32	
	Depth	mm		900			1120	
		in		35-7/16			44-1/8	
Net weight		kg		70			100	
		lb		155			221	
FAN	Airflow rate (Low-High)		m^3/min	26.5-38.0	26.5-38.0	28.0-40.0	58.0	72.0
			cfm	936-1342	936-1342	989-1412	2048	2541
	External static pressure *3	Pa	208V	N/A -50-160	N/A -50-160	N/A -50-160	70-160	70-160
			230V	100-150-200	100-150-200	100-150-200	100-200	100-200
Noise level (Low-High) *2		dB(A)	208V	31-41	31-41	31-41	45	52
			230V	38-44	38-44	38-44	47	54
Filter				Standard filter				

Notes: *1 Cooling/Heating capacity indicates the maximum value at operation under the following condition.
Cooling: Indoor: 26.7 ˚C [80 ˚F] DB/19.4 ˚C [67 ˚F] WB Outdoor: 35 ˚C [95 ˚F] DB
Heating: Indoor: 21.1 ˚C [70 ˚F] DB Outdoor: 8.3 ˚C [47 ˚F] DB/6.1 ˚C [43 ˚F] WB

*2 The operating noise is the data that was obtained in an anechoic room.

*3 As for the factory setting is below.

PEFY-P-NMHU-E series

PEFY-P15NMHU-E		PEFY-P18NMHU-E		PEFY-P24NMHU-E		PEFY-P27NMHU-E		PEFY-P30NMHU-E	
208V	230V	208V	230V	208V	230V	208V	230V	208V	230V
50	150	50	150	50	150	50	150	50	150

PEFY-P36NMHU-E		PEFY-P48NMHU-E		PEFY-P54NMHU-E		PEFY-P72NMHU-E		PEFY-P96NMHU-E	
208V	230V	208V	230V	208V	230V	208V	230V	208V	230V
50	150	50	150	50	150	160	200	160	200

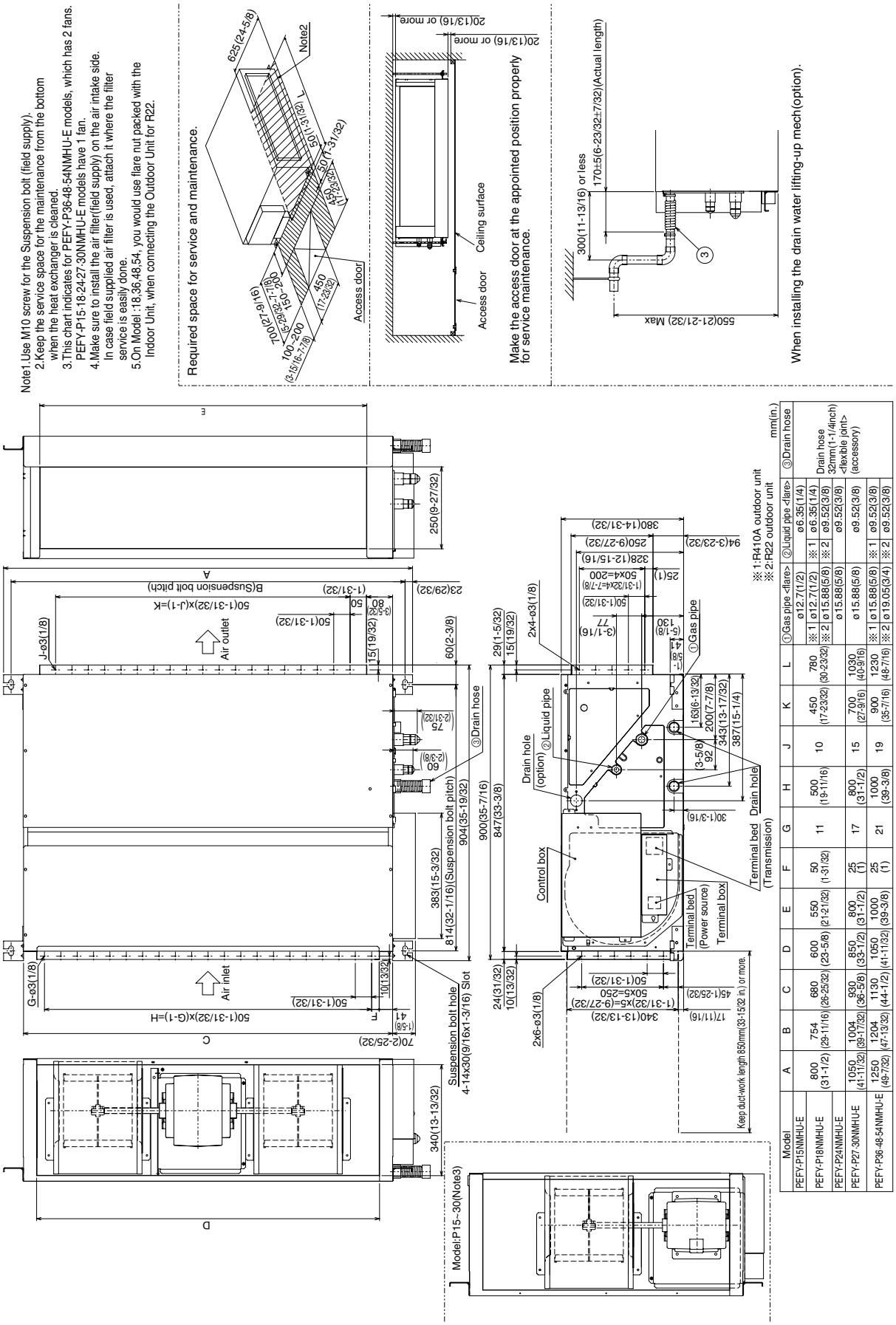
3-2. Electrical parts specifications

Parts name \ Model	Symbol	PEFY-P15 NMHU-E	PEFY-P18 NMHU-E	PEFY-P24 NMHU-E	PEFY-P27 NMHU-E	PEFY-P30 NMHU-E	PEFY-P36 NMHU-E	PEFY-P48 NMHU-E	PEFY-P54 NMHU-E	PEFY-P72 NMHU-E	PEFY-P96 NMHU-E
Tranrsformer	T	(Primary) 50/60Hz 220-240V (Secondry) (23.5V 0.9A)									
Room temperature thermistor	TH21	Resistance0˚C[32˚F]/15kΩ,10˚C[50˚F]/9.6kΩ,20˚C[68˚F]/6.3kΩ,25˚C[77˚F]/5.4kΩ, 30˚C[86˚F]/4.3kΩ,40˚C[104˚F]/3.0kΩ									
Liquid pipe thermistor	TH22	Resistance0˚C[32˚F]/15kΩ,10˚C[50˚F]/9.6kΩ,20˚C[68˚F]/6.3kΩ,25˚C[77˚F]/5.4kΩ, 30˚C[86˚F]/4.3kΩ,40˚C[104˚F]/3.0kΩ									
Gas pipe thermistor	TH23	Resistance0˚C[32˚F]/15kΩ,10˚C[50˚F]/9.6kΩ,20˚C[68˚F]/6.3kΩ,25˚C[77˚F]/5.4kΩ, 30˚C[86˚F]/4.3kΩ,40˚C[104˚F]/3.0kΩ									
Fuse (Indoor controller board)	FUSE	250V 6.3A									
Fan motor (with Inner-thermostat)	MF1,2	4-pole OUTPUT 130W NC-45VMH		4-pole Output 180W NC-71VMH	4-pole Output 220W NC-80VMH	4-pole Output 230W NC-90VMH	4-pole OUTPUT 400W NS-112VMH			4-pole Output 650W NS-224M-C1	4-pole Output 850W NS-280M-C1
Inner-thermostat (Fan motor)		OFF135˚C ± 5˚C[275˚F ± 41˚F] ON 95˚C ± 20˚C[203˚F ± 59˚F]									
Fan motor capacitor	C1	3.0μF×440V		4.0μF ×440V	5.0μF×440V		7.0μF×440V			–	
Linear expansion valve	LEV	DC12V Stepping motor drive port dimension ø 3.2 (0~1800pulse <at R410A outdoor unit> 0~2000pulse <at the other outdoor unit>)			DC12V Stepping motor drive port dimension ø 5.2 (0~1800pulse <at R410A outdoor unit> 0~2000pulse <at the other outdoor unit>)			DC12V Stepping motor drive port dimension ø 6.4 (0~1800pulse <at R410A outdoor unit> 0~2000pulse <at the other outdoor unit>)		DC12V Stepping motor drive port dimension ø 5.2 (0~1800pulse <at R410A outdoor unit> 0~2000pulse <at the other outdoor unit>)	
Power supply terminal bed	TB2	(L1,L2,G) 330V 30A								(L1,L2,L3,G,⏚) 660V 40A	
Transmission terminal bed	TB5 TB15	(1,2),(M1,M2,S) 300V 10A									

4 OUTLINES AND DIMENSIONS

PEFY-P15·18·24·27·30·36·48·54NMHU-E

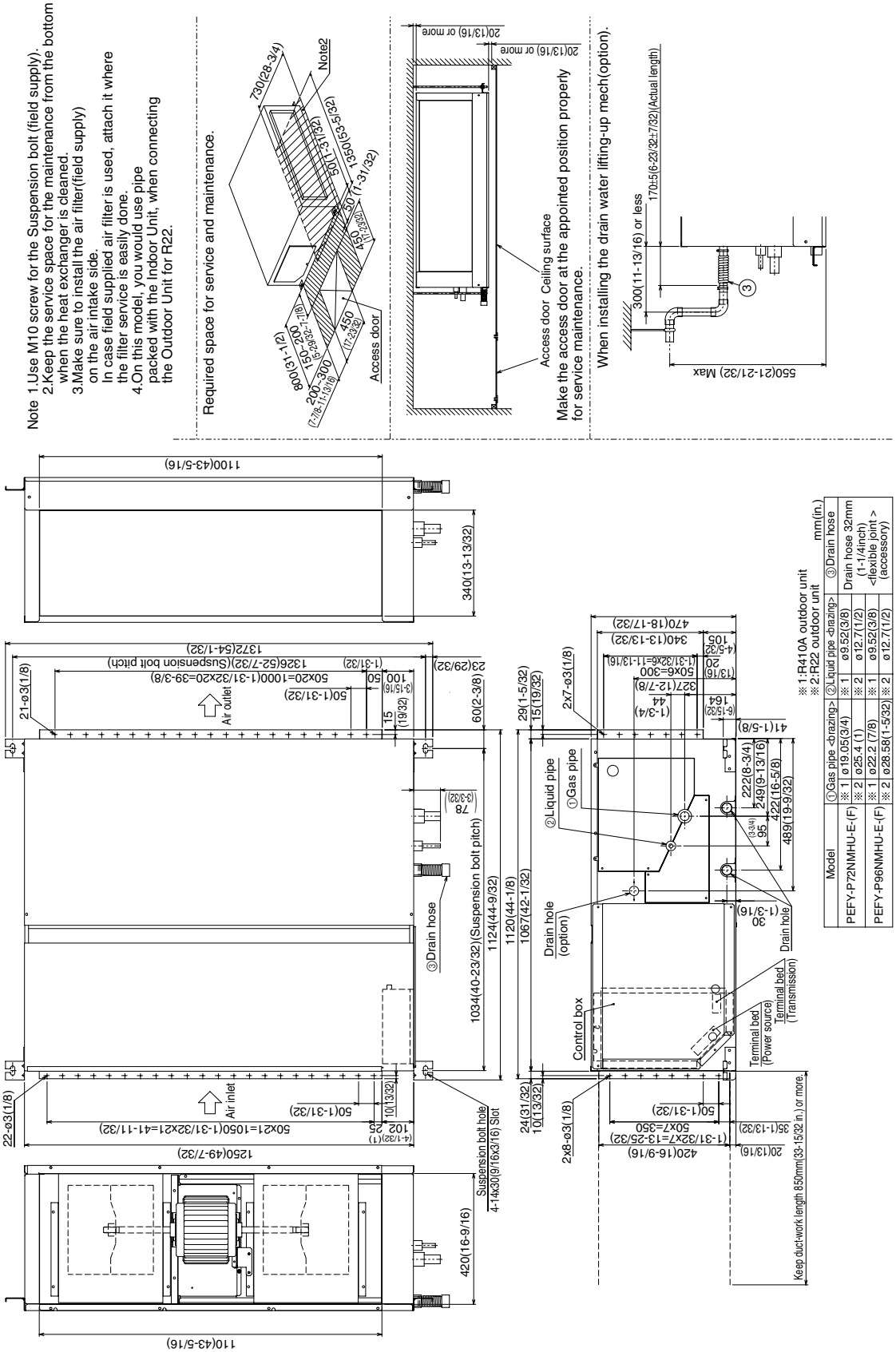
Unit :mm(in.)


Note1.Use M10 screw for the Suspension bolt (field supply).
2.Keep the service space for the maintenance from the bottom when the heat exchanger is cleaned.
3.This chart indicates for PEFY-P36·48·54NMHU-E models, which has 2 fans. PEFY-P15·18·24·27·30NMHU-E models have 1 fan.
4.Make sure to install the air filter(field supply) on the air intake side. In case field supplied air filter is used, attach it where the filter service is easily done.
5.On Model :18,36,48,54, you would use flare nut packed with the Indoor Unit, when connecting the Outdoor Unit for R22.
Required space for service and maintenance.
Note2
625(24-5/8)
Access door
20(13/16) or more
Ceiling surface
Access door
Make the access door at the appointed position properly for service maintenance.
300(11-13/16) or less
170±5(6-23/32±7/32)(Actual length)
550(21-21/32) Max
When installing the drain water lifting-up mech(option).
Air outlet
Air inlet
Suspension bolt hole 4-14x30(9/16x1-3/16) Slot
Drain hole (option)
Liquid pipe
Gas pipe
Control box
Terminal bed (Power source)
Terminal box
Terminal bed (Transmission)
Drain hole
Keep duct-work length 850mm(33-15/32 in.) or more.
Model:P15·30(Note3)
※1:R410A outdoor unit
※2:R22 outdoor unit
mm(in.)

Model	A	B	C	D	E	F	G	H	J	K	L	①Gas pipe <flare>	②Liquid pipe <flare>	③Drain hose
PEFY-P15NMHU-E	800 (31-1/2)	754 (29-11/16)	680 (26-25/32)	600 (23-5/8)	550 (21-21/32)	50 (1-31/32)	11	500 (19-11/16)	10	450 (17-23/32)	780 (30-23/32)	ø12.7(1/2)	ø6.35(1/4)	Drain hose 32mm(1-1/4inch) <flexible joint> (accessory)
PEFY-P18NMHU-E												※1 ø12.7(1/2) ※2 ø15.88(5/8)	※1 ø6.35(1/4) ※2 ø9.52(3/8)	
PEFY-P24NMHU-E												ø15.88(5/8)	ø9.52(3/8)	
PEFY-P27·30NMHU-E	1050 (41-11/32)	1004 (39-17/32)	930 (36-5/8)	850 (33-1/2)	800 (31-1/2)	25 (1)	17	800 (31-1/2)	15	700 (27-9/16)	1030 (40-9/16)	ø15.88(5/8)	ø9.52(3/8)	
PEFY-P36·48·54NMHU-E	1250 (49-7/32)	1204 (47-13/32)	1130 (44-1/2)	1050 (41-11/32)	1000 (39-3/8)	25 (1)	21	1000 (39-3/8)	19	900 (35-7/16)	1230 (48-7/16)	※1 ø15.88(5/8) ※2 ø19.05(3/4)	※1 ø9.52(3/8) ※2 ø9.52(3/8)	

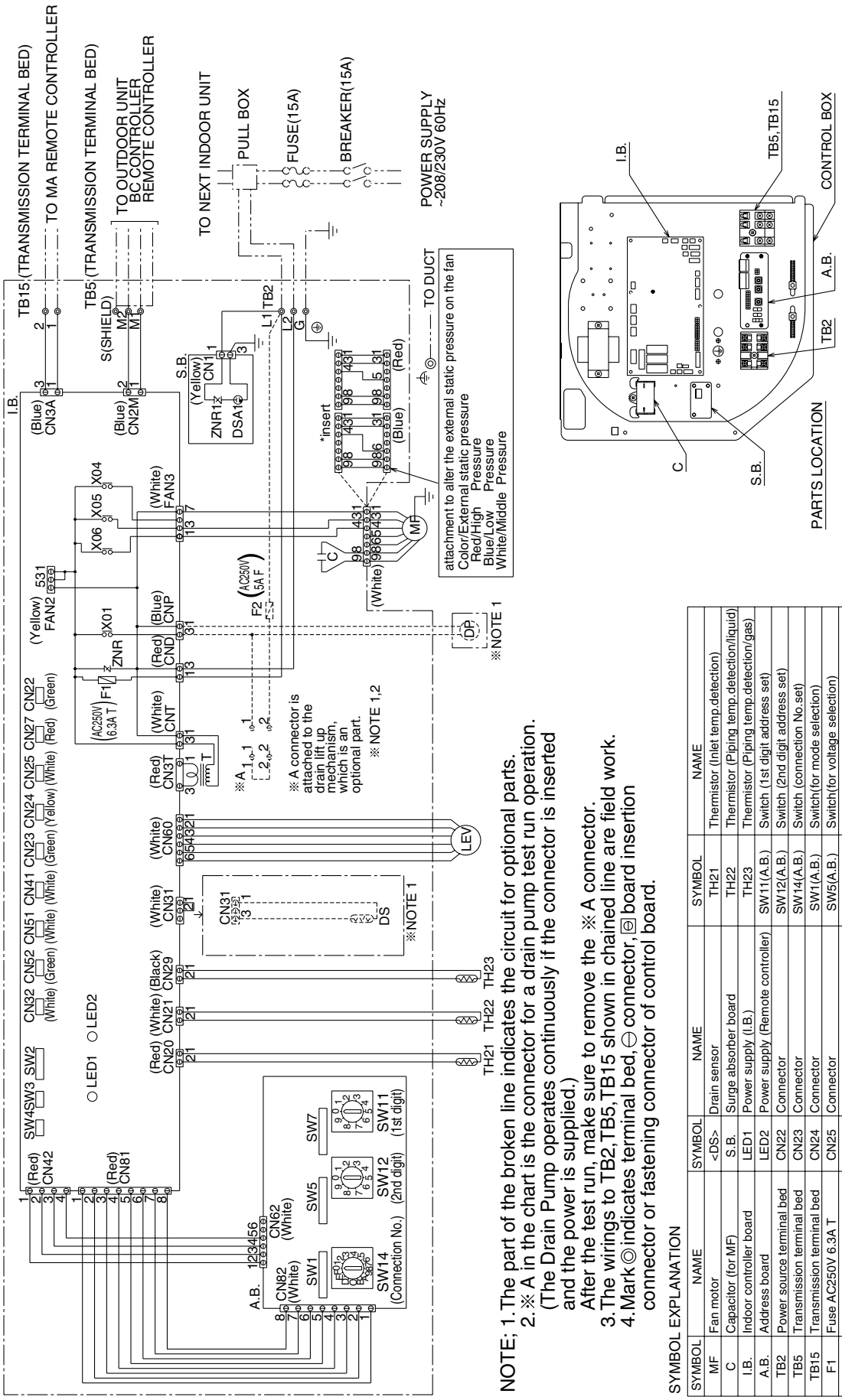
PEFY-P72·96NMHU-E

Unit :mm(in.)



5 WIRING DIAGRAM

PEFY-P15·18·24·27·30·36·48·54NMHU-E



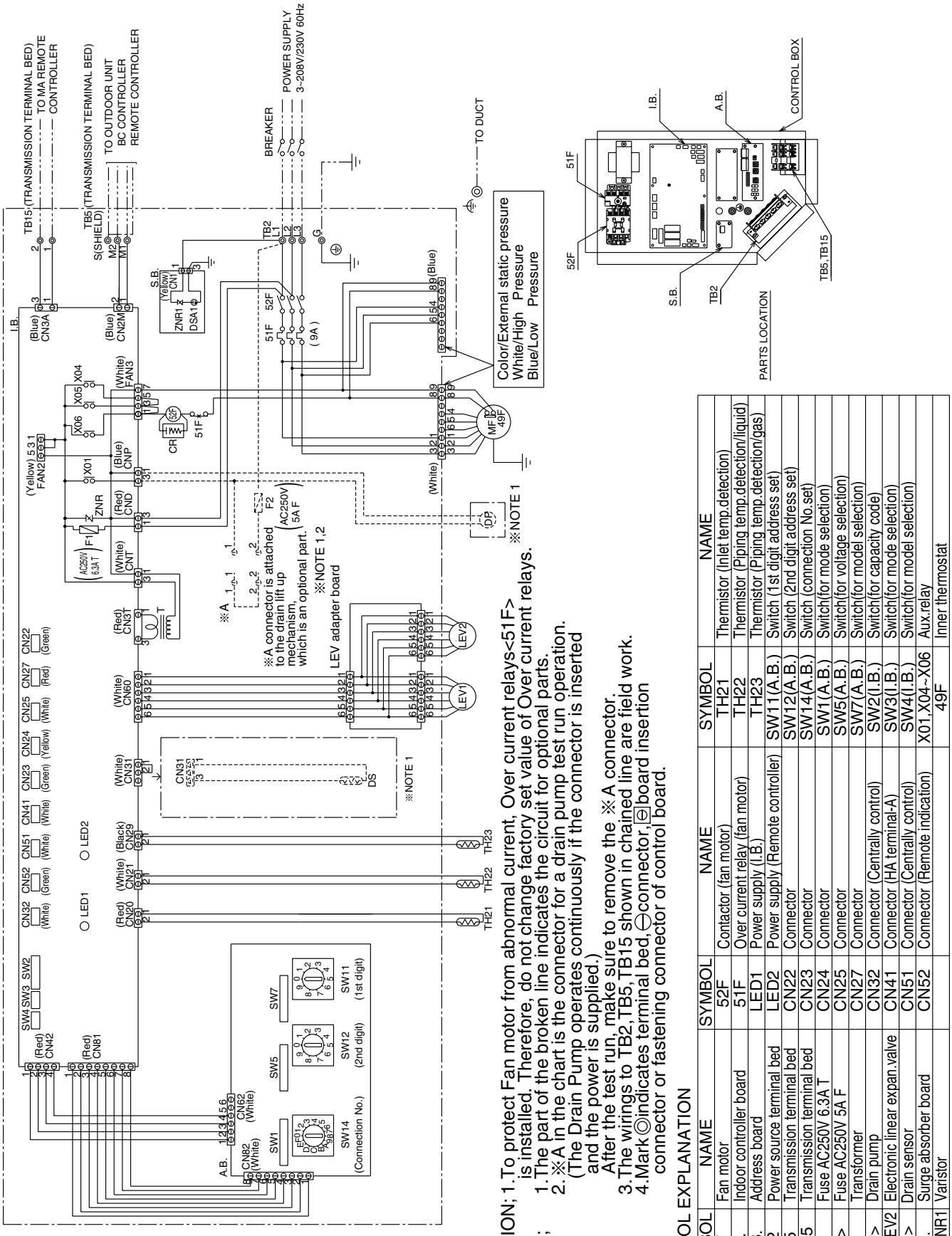
NOTE; 1. The part of the broken line indicates the circuit for optional parts.
2. ※ A in the chart is the connector for a drain pump test run operation.
(The Drain Pump operates continuously if the connector is inserted and the power is supplied.)
After the test run, make sure to remove the ※ A connector.
3. The wirings to TB2,TB5,TB15 shown in chained line are field work.
4. Mark ◎ indicates terminal bed, ⊖ connector, ⊡ board insertion connector or fastening connector of control board.

SYMBOL EXPLANATION

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
MF	Fan motor	<DS>	Drain sensor	TH21	Thermistor (Inlet temp.detection)
C	Capacitor (for MF)	S.B.	Surge absorber board	TH22	Thermistor (Piping temp.detection/liquid)
I.B.	Indoor controller board	LED1	Power supply (I.B.)	TH23	Thermistor (Piping temp.detection/gas)
A.B.	Address board	LED2	Power supply (Remote controller)	SW11(A.B.)	Switch (1st digit address set)
TB2	Power source terminal bed	CN22	Connector	SW12(A.B.)	Switch (2nd digit address set)
TB5	Transmission terminal bed	CN23	Connector	SW14(A.B.)	Switch (connection No.set)
TB15	Transmission terminal bed	CN24	Connector	SW1(A.B.)	Switch(for mode selection)
F1	Fuse AC250V 6.3A T	CN25	Connector	SW5(A.B.)	Switch(for voltage selection)
<F2>	Fuse AC250V 5A F	CN27	Connector	SW7(A.B.)	Switch(for model selection)
T	Transformer	CN32	Connector (Centrally control)	SW2(I.B.)	Switch(for capacity code)
<DP>	Drain pump	CN41	Connector (HA terminal-A)	SW3(I.B.)	Switch(for mode selection)
LEV	Electronic linear expan.valve	CN51	Connector (Centrally control)	SW4(I.B.)	Switch(for model selection)
ZNR,ZNR1	Varistor	CN52	Connector (Remote indication)	X01,X04~X06	Aux.relay

Inside < > is the optional parts.

PEFY-P72·96NMHU-E



CAUTION; 1.To protect Fan motor from abnormal current, Over current relays<51F> is installed. Therefore, do not change factory set value of Over current relays.

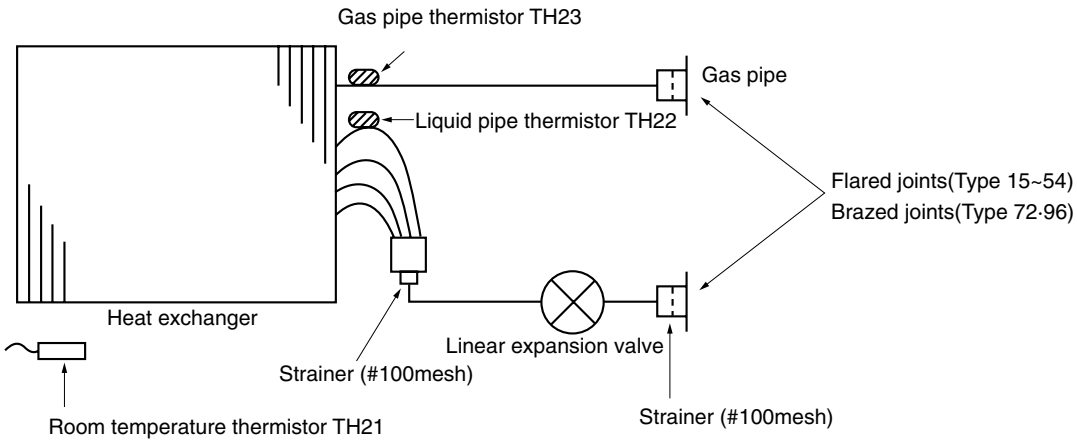
NOTE; 1.The part of the broken line indicates the circuit for optional parts.
2. ※A in the chart is the connector for a drain pump test run operation. (The Drain Pump operates continuously if the connector is inserted and the power is supplied.) After the test run, make sure to remove the ※A connector.
3.The wirings to TB2,TB5,TB15 shown in chained line are field work.
4.Mark ◎indicates terminal bed, ⊖connector, ⊜board insertion connector or fastening connector of control board.

SYMBOL EXPLANATION

SYMBOL	NAME	SYMBOL	NAME	SYMBOL	NAME
MF	Fan motor	52F	Contactor (fan motor)	TH21	Thermistor (Inlet temp.detection)
I.B.	Indoor controller board	51F	Over current relay (fan motor)	TH22	Thermistor (Piping temp.detection/liquid)
A.B.	Address board	LED1	Power supply (I.B.)	TH23	Thermistor (Piping temp.detection/gas)
TB2	Power source terminal bed	LED2	Power supply (Remote controller)	SW11(A.B.)	Switch (1st digit address set)
TB5	Transmission terminal bed	CN22	Connector	SW12(A.B.)	Switch (2nd digit address set)
TB15	Transmission terminal bed	CN23	Connector	SW14(A.B.)	Switch (connection No.set)
F1	Fuse AC250V 6.3A T	CN24	Connector	SW1(A.B.)	Switch(for mode selection)
<F2>	Fuse AC250V 5A F	CN25	Connector	SW5(A.B.)	Switch(for voltage selection)
T	Transformer	CN27	Connector	SW7(A.B.)	Switch(for model selection)
<DP>	Drain pump	CN32	Connector (Centrally control)	SW2(I.B.)	Switch(for capacity code)
LEV1,LEV2	Electronic linear expan.valve	CN41	Connector (HA terminal-A)	SW3(I.B.)	Switch(for mode selection)
<DS>	Drain sensor	CN51	Connector (Centrally control)	SW4(I.B.)	Switch(for model selection)
S.B.	Surge absorber board	CN52	Connector (Remote indication)	X01,X04~X06	Aux.relay
ZNR,ZNR1	Varistor			49F	Inner thermostat

Inside < > is the optional parts.

6 REFRIGERANT SYSTEM DIAGRAM



mm <in.>

Item \ Capacity		PEFY-P15NMHU-E	PEFY-P18NMHU-E	PEFY-P24,27,30NMHU-E
Gas pipe	R410A	ø 12.7 (1/2)		ø 15.88 (5/8)
	R22	ø 12.7 (1/2)	ø 15.88 (5/8)	
Liquid pipe	R410A	ø 6.35 (1/4)		ø 9.52 (3/8)
	R22	ø 6.35 (1/4)	ø 9.52 (3/8)	

mm <in.>

Item \ Capacity		PEFY-P36,48,54NMHU-E	PEFY-P72NMHU-E	PEFY-P96NMHU-E
Gas pipe	R410A	ø 15.88 (5/8)	ø 19.05 (3/4)	ø 22.2 (7/8)
	R22	ø 19.05 (3/4)	ø 25.4 (1)	ø 28.58 (9/8)
Liquid pipe	R410A	ø 9.52 (3/8)		
	R22	ø 9.52 (3/8)	ø 12.7 (1/2)	

7 TROUBLE SHOOTING

7-1. How to check the parts

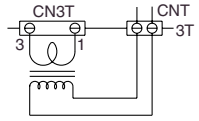
Room temperature thermistor (TH21) / Liquid pipe thermistor (TH22) / Gas pipe thermistor (TH23)

Disconnect the connector, then measure the resistance using a tester.
(Sorrounding temperature 10°C~30°C[50°F~86°F])

Normal	Abnormal
4.3kΩ~9.6kΩ	Open or short

(Refer to the thermistor characteristic graph)

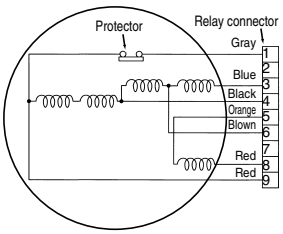
Trans



Disconnect the connector and measure the resistance using a tester.

	Normal	Abnormal
CNT(1)-(3)	App.15Ω	Open or short
CN3T(1)-(3)	App.4Ω	

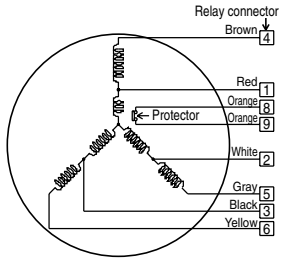
Fan motor PEFY-P15~54



Measure the resistance between the terminals using a tester. (at 20˚C[68°F])

Motor terminal or Relay connector	Normal					Abnormal
	P40· 50	P63	P71	P80	P100·125·140	
Gray-Orange	68.8Ω	47Ω	32.9Ω	33.3Ω	14.05Ω	Open or short
Gray-Black	53.73Ω	37.29Ω	27.56Ω	27.1Ω	9.11Ω	
Gray-Brown	59.92Ω	39.81Ω	30.64Ω	28.56Ω	9.87Ω	
Gray-Blue	74.17Ω	49.8Ω	38.31Ω	36.82Ω	12.89Ω	

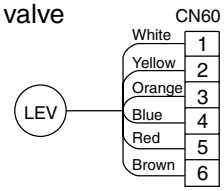
Fan motor PEFY-P72・96



Measure the resistance between the terminals using a tester. (at 20˚C[68°F])

Motor terminal or Relay connector	Normal	Abnormal
Red-White	6.68Ω	Open or short
White-Black	6.68Ω	
Red-Black	6.68Ω	
Brown-Gray	8.144Ω	
Gray-Yellow	8.144Ω	
Brown-Yellow	8.144Ω	

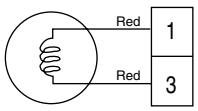
Linear expansion valve



Disconnect the connector then measure the resistance valve using a tester.

Normal				Abnormal
(1)-(5) White-Red	(2)-(6) Yellow-Brown	(3)-(5) Orange-Red	(4)-(6) Blue-Brown	Open or short
150Ω ±10%				

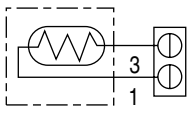
Drain Pump (Drain water lift up kit)



Disconnect the connector then measure the resistance valve using a tester.
(Sorrounding temperature 20°C~30°C[68°F~86°F])

Normal	Abnormal
399Ω	Open or short

Drain sensor (Drain water lift up kit)



Measure the resistance between the terminals using a tester. (Refer to the thermistor characteristic graph)

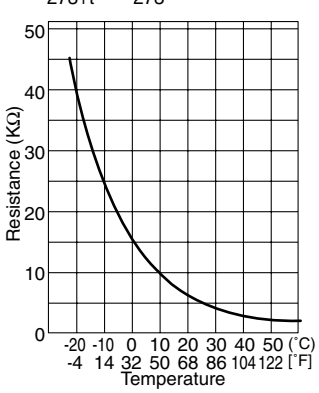
0˚C/6.0kΩ, 10˚C/3.9kΩ
20˚C/2.6kΩ, 25˚C/2.2kΩ
30˚C/1.8kΩ, 40˚C/1.3kΩ

<Thermistor characteristic graph>
Room temperature thermistor(TH21)
Liquid pipe thermistor(TH22)
Gas pipe temperature thermistor(TH23)
Drain sensor(DS)

Thermistor R_0=15kΩ ± 3%
Fixed number of B=3480kΩ ± 2%

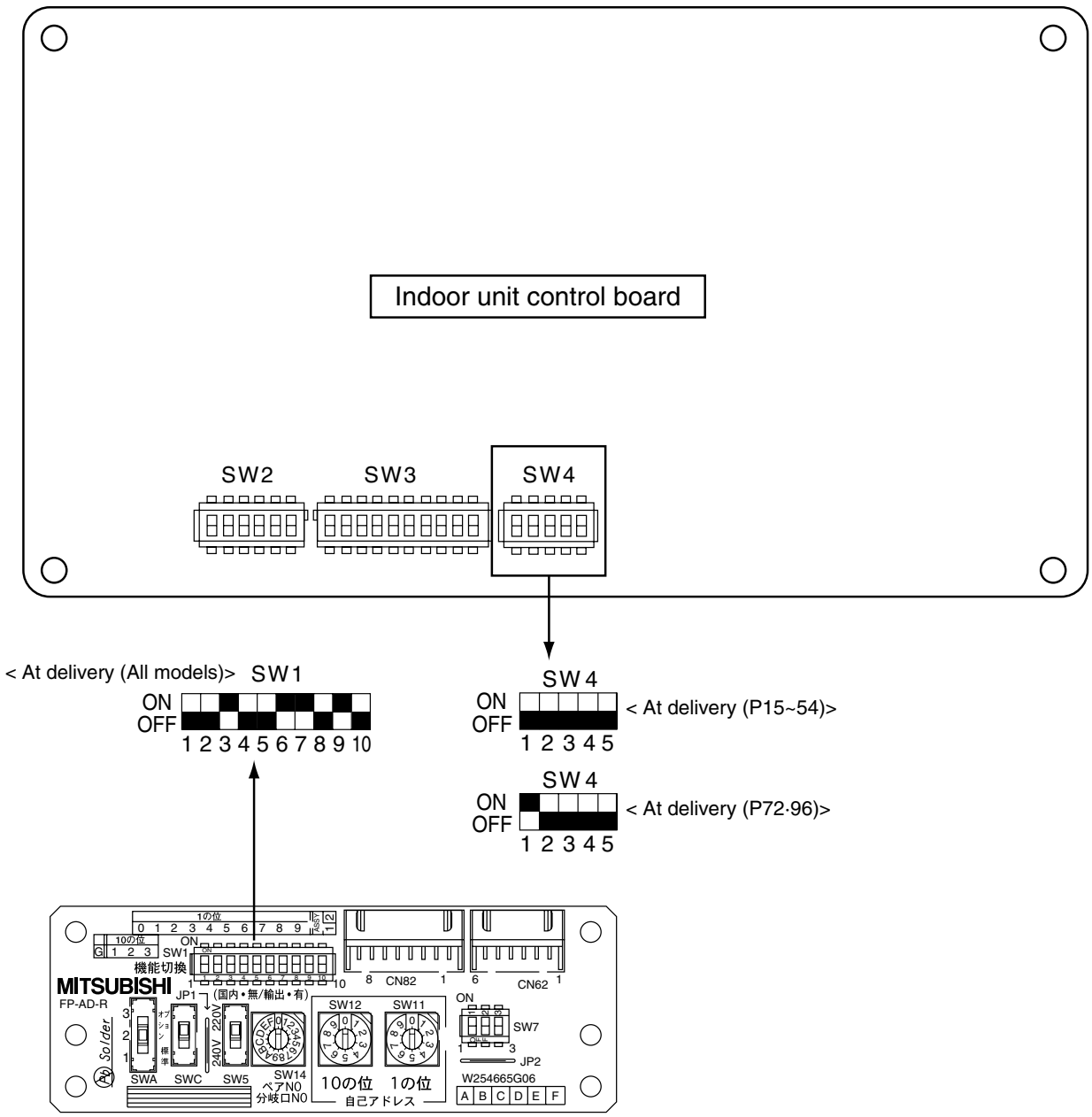
$$Rt=15\exp\{3480(\frac{1}{273+t}-\frac{1}{273})\}$$

0˚C 32˚F 15kΩ
10˚C 50˚F 9.6kΩ
20˚C 68˚F 6.3kΩ
25˚C 77˚F 5.2kΩ
30˚C 86˚F 4.3kΩ
40˚C 104˚F 3.0kΩ



7-2. Setting of address switch

Make sure that power source is turning off.



1)In case using M-NET remote controller, address is set by rotary switches.(SW11,SW12)

* It is not necessary setting address in case of using unit remote controller.

Indoor unit do not run without address setting in field.

2) Indoor unit address setting rule is different by each field work.
Refer to install manual of outdoor unit , operate the address setting.

3)Setting the address is combination of SW11(1st digit address setting) and SW12(2nd digit address setting).

Address " 3 " setting is composed SW11 " 3 " and SW12 " 0 " .

Address " 25 " setting is composed SW11 " 5 " and SW12 " 2 " .

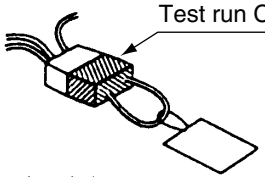
7-3. Setting of Dip-switch (at delivery)

Models	Dip-SW							
PEFY-P15 NMHU-E	SW1 ON OFF 1 2 3 4 5 6 7 8 9 10	SW2 ON OFF 1 2 3 4 5 6	SW3 ON OFF 1 2 3 4 5 6 7 8 9 10	SW4 ON OFF 1 2 3 4 5	SW5 ON OFF 220V 240V	SW7 ON OFF 1 2 3	SWA 1	SWC Standard Indicate "標準"
PEFY-P18 NMHU-E	SW1 ON OFF 1 2 3 4 5 6 7 8 9 10	SW2 ON OFF 1 2 3 4 5 6	SW3 ON OFF 1 2 3 4 5 6 7 8 9 10	SW4 ON OFF 1 2 3 4 5	SW5 ON OFF 220V 240V	SW7 ON OFF 1 2 3		
PEFY-P24 NMHU-E	SW1 ON OFF 1 2 3 4 5 6 7 8 9 10	SW2 ON OFF 1 2 3 4 5 6	SW3 ON OFF 1 2 3 4 5 6 7 8 9 10	SW4 ON OFF 1 2 3 4 5	SW5 ON OFF 220V 240V	SW7 ON OFF 1 2 3		
PEFY-P27 NMHU-E	SW1 ON OFF 1 2 3 4 5 6 7 8 9 10	SW2 ON OFF 1 2 3 4 5 6	SW3 ON OFF 1 2 3 4 5 6 7 8 9 10	SW4 ON OFF 1 2 3 4 5	SW5 ON OFF 220V 240V	SW7 ON OFF 1 2 3		
PEFY-P30 NMHU-E	SW1 ON OFF 1 2 3 4 5 6 7 8 9 10	SW2 ON OFF 1 2 3 4 5 6	SW3 ON OFF 1 2 3 4 5 6 7 8 9 10	SW4 ON OFF 1 2 3 4 5	SW5 ON OFF 220V 240V	SW7 ON OFF 1 2 3		
PEFY-P36 NMHU-E	SW1 ON OFF 1 2 3 4 5 6 7 8 9 10	SW2 ON OFF 1 2 3 4 5 6	SW3 ON OFF 1 2 3 4 5 6 7 8 9 10	SW4 ON OFF 1 2 3 4 5	SW5 ON OFF 220V 240V	SW7 ON OFF 1 2 3		
PEFY-P48 NMHU-E	SW1 ON OFF 1 2 3 4 5 6 7 8 9 10	SW2 ON OFF 1 2 3 4 5 6	SW3 ON OFF 1 2 3 4 5 6 7 8 9 10	SW4 ON OFF 1 2 3 4 5	SW5 ON OFF 220V 240V	SW7 ON OFF 1 2 3		
PEFY-P54 NMHU-E	SW1 ON OFF 1 2 3 4 5 6 7 8 9 10	SW2 ON OFF 1 2 3 4 5 6	SW3 ON OFF 1 2 3 4 5 6 7 8 9 10	SW4 ON OFF 1 2 3 4 5	SW5 ON OFF 220V 240V	SW7 ON OFF 1 2 3		
PEFY-P72 NMHU-E	SW1 ON OFF 1 2 3 4 5 6 7 8 9 10	SW2 ON OFF 1 2 3 4 5 6	SW3 ON OFF 1 2 3 4 5 6 7 8 9 10	SW4 ON OFF 1 2 3 4 5	SW5 ON OFF 220V 240V	SW7 ON OFF 1 2 3		
PEFY-P96 NMHU-E	SW1 ON OFF 1 2 3 4 5 6 7 8 9 10	SW2 ON OFF 1 2 3 4 5 6	SW3 ON OFF 1 2 3 4 5 6 7 8 9 10	SW4 ON OFF 1 2 3 4 5	SW5 ON OFF 220V 240V	SW7 ON OFF 1 2 3		

7-4. Attention for test run

Equipment which is attached drain water lift up kit can be tested pump out test when power supplied.(connect the connector(A))

< Drain-up machine >



After pump out test, remove the connector and put in the dummy connector.

After test run,remove the connector (A)(Fig .1)

7-5. Function the LED of the indoor unit service board

Symbol	LED operation under normal state
LED1	At applying main power source → Lighting
LED2	At receiving MA transmission power source → Lighting

8 DISASSEMBLY PROCEDURE

8-1. CONTROL BOX

Be careful on removing heavy parts.

OPERATING PROCEDURE	PHOTOS

Models 15~54

1.Removing the control box cover

(1) Remove the fixing screws (two) of the control box (A), and remove the cover. (Fig. 1)

*At this stage, the following servicing is possible.

1 Operation and check of the switches (listed below) which are on the control board.
- Dip switch SW2 ····· Capacity code setting
- Dip switch SW3 ····· Function change
- Dip switch SW4 ····· Model code setting

2 Connection check of the lead wires (listed below) which are connected to the controller board.
- Power supply lead wire.
- Network remote contoller transmission lead wire.
- Fan motor lead wire.
- LEV lead wire
- Intake air sensor lead wire
- Liquid piping sensor lead wire
- Gas piping sensor lead wire
- Power supply transformer lead wire

Address board lead wire
(• Drain pump lead wire)
(• Drain sensor lead wire)

3 Control board exchange
4 Condenser exchange
5 Power supply transformer exchange
6 Arrest exchange
7 Intake air sensor exchange

( ):Optional parts

2.Removing the terminal bed cover

(1) Remove the fixing screws (two) of the terminal bed cover (B), and remove the cover. (Fig. 2)

*At this stage, the following servicing is possible.(Fig. 3)

1 Operation and check of the switches (listed below) which are on the adress board.
- Rotary switches SW11, 12 ··· Address setting
- Rotary switch SW14 ····· Branch port setting
- Dip switch SW1 ····· Function change (main)

2 Address board exchange
3 Power supply terminal bed exchange
4 Transmission terminal bed exchange

Fig.1

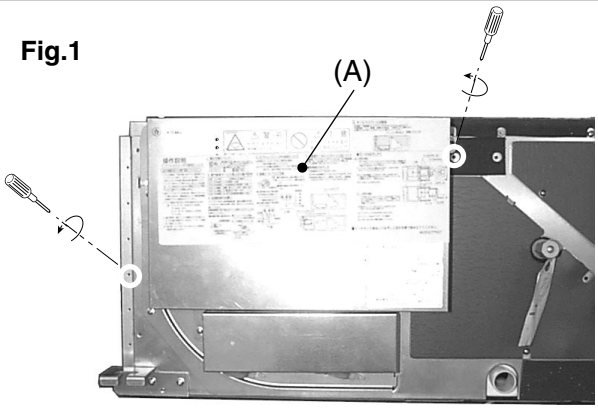


Fig.2

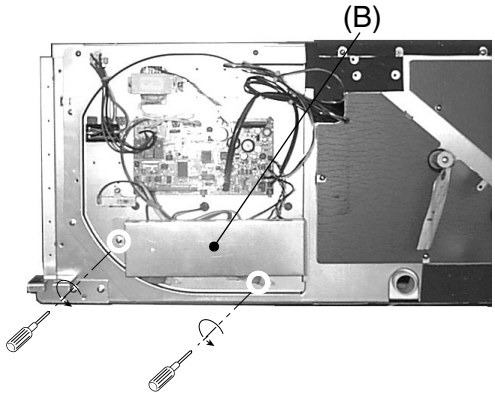
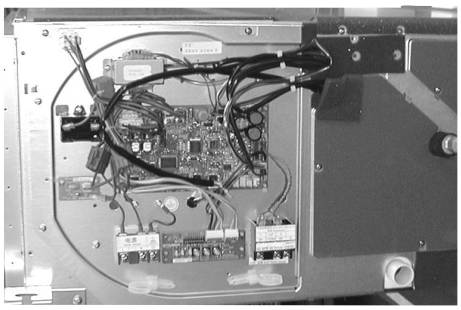
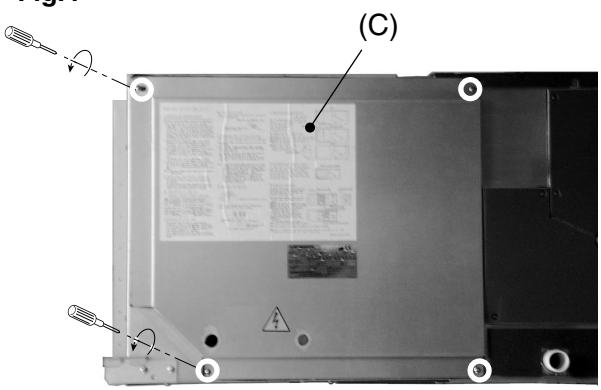
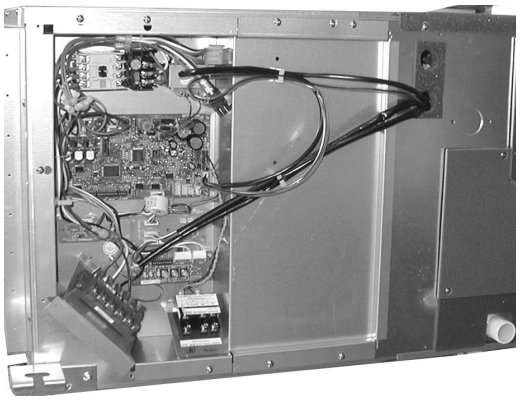


Fig.3

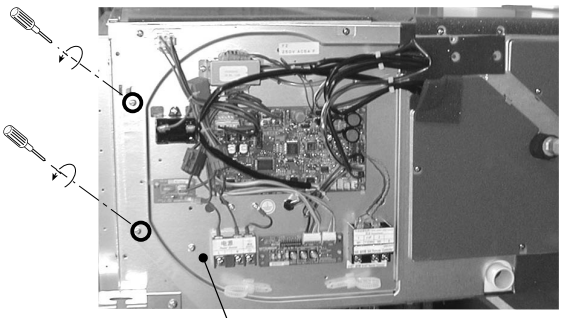
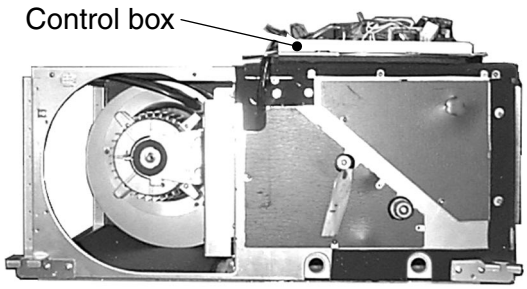
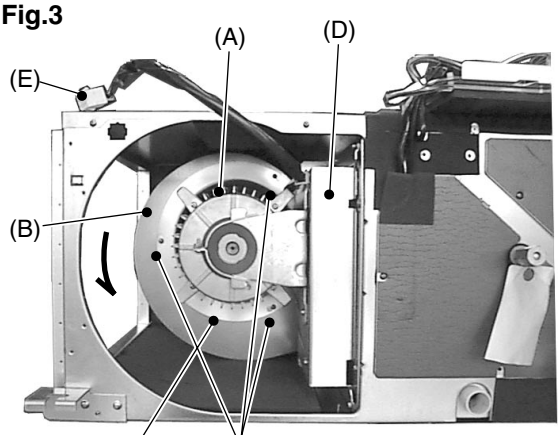
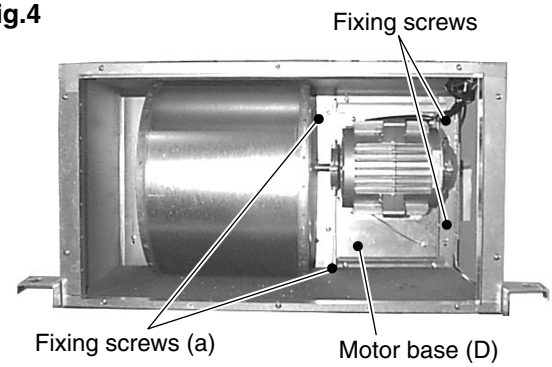


Be careful on removing heavy parts.

OPERATING PROCEDURE	PHOTOS
Models 72 • 96 **1.Removing the control box cover** (1) Remove the fixing screws (four) of the control box cover (C), and remove the cover. (Fig. 4) *At this stage, the following servicing is possible.(Fig. 5) 1 Operation and check of the switches (listed below) which are on the control board. • Dip switch SW2 ····· Capacity code setting • Dip switch SW3 ····· Function change • Dip switch SW4 ····· Model code setting 2 Connection check of the lead wires (listed below) which are connected to the controller board. • Power supply lead wire. • Network remote contoller transmission lead wire. • Fan motor lead wire. • LEV lead wire • Intake air sensor lead wire • Liquid piping sensor lead wire • Gas piping sensor lead wire • Power supply transformer lead wire • Address board lead wire (• Drain pump lead wire) (• Drain sensor lead wire) 3 Control board exchange 4 Power supply transformer exchange 5 Arrest exchange 6 Intake air sensor exchange 7 Operation and check of the switches (listed below) which are on the address board • Rotary switches SW11, 12 ···· Address setting • Rotary switch SW14 ····· Branch port setting • Dip switch SW1····· Function change (main) 8 Address board exchange 9 Power supply terminal bed exchange 10 Transmission terminal bed exchange ( ):Optional parts	**Fig.4**  **Fig.5** 

8-2. FAN and FAN MOTOR

Be careful on removing heavy parts.

OPERATING PROCEDURE	PHOTOS
Models 15~54 **1.Removing the control box.** (1) Remove the control box cover and terminal bed cover with procedure 8-1. (2) Remove the fan motor connectors. (3) Remove the fixing screws (two) of the control box and slide the control box to remove.(Fig. 1) (4) Move the control box to place that is not block operation. (Fig. 2)	**Fig.1**  **Fig.2** 
2.Removing the fan motor **Models 15~30** *After motor base (D) and bell mouse (C) attached the fan case (B) removed,motor (A) can be pull with motor base and fan along rail. (1) Remove the fan motor connector (E). (2) Loosen the fixing screws (F) (three) of the bell mouse (C), and removed the bell mouse (D) turning screws in direction arrow (counterclockwise).(Fig. 3) (3) Remove the fixing screws (four) of the motor base(D). Notice: It's necessary using the driver over 30cm length to remove the fixing screws (a) . (Fixing screws are placed back)	**Fig.3**  Loosen fixing screws (not remove) Models 40~63 **Fig.4** 

Be careful on removing heavy parts.

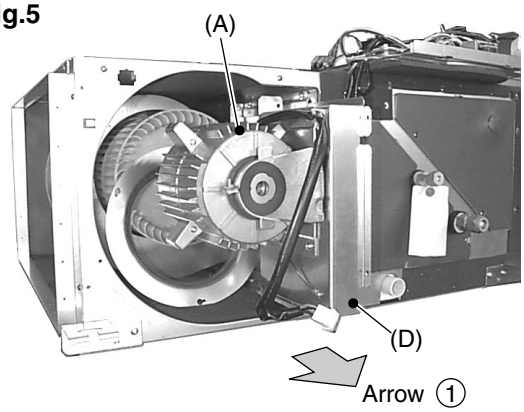
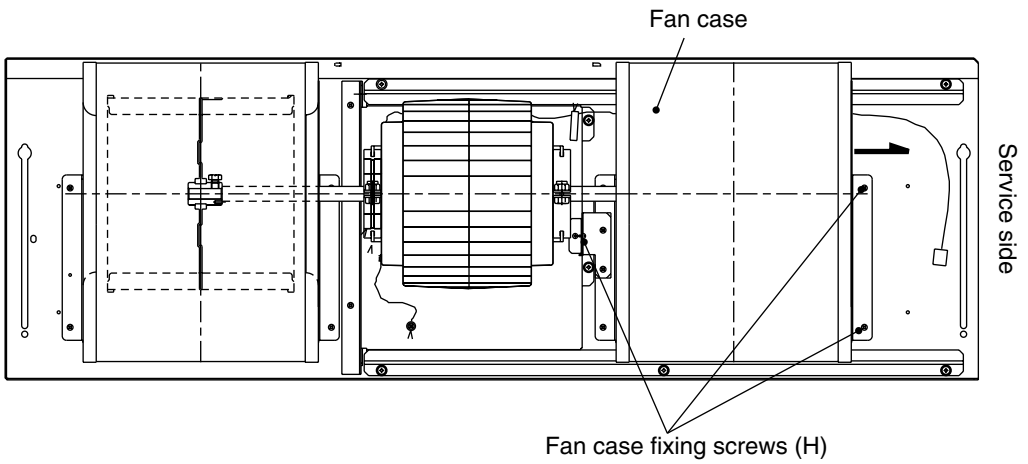
OPERATING PROCEDURE	PHOTOS
(4) Slide the motor (A) with motor base (D) in direction of allow ①. (Fig. 5)	**Fig.5**  **Fig.6** Motor (A)
Models 36•48•54 *Motor maintenance procedure is almost 15~30 models procedure. Models 36~54 have twin shaft motor.After removing the fan and fan case which are in front of motor,remove the motor. (1) Remove the bell mouse of the front fan motor with procedure models 15~54. (2) Loosen the setting screws of the front fan , removed the fan. (3) Remove the front fan case. (4) Operate with procedure models 15~30. Notice: Fixing screws of the fan case are shown Fig. 7. Remove the fixing screws (H) ,fan case can be removed.	

Fig.7



Be careful on removing heavy parts.

OPERATING PROCEDURE	PHOTOS

Models 72·96

1.Removing the control box.

(1) Remove the control box cover1 with procedure 8-1.
(2) Remove the fixing screws (four) of the control cover 2, and remove the control cover2. (Fig. 7)
(3) Remove the fan motor connectors.
(4) Remove the fixing screws (three) of the control box and remove the control box (Fig. 8)
(5) Move the control box to place that is not block operation. (Fig. 9)

Fig.7

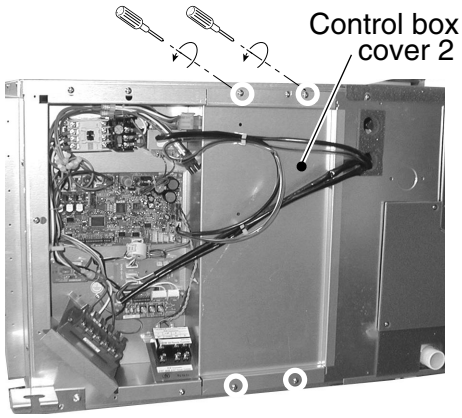


Fig.8

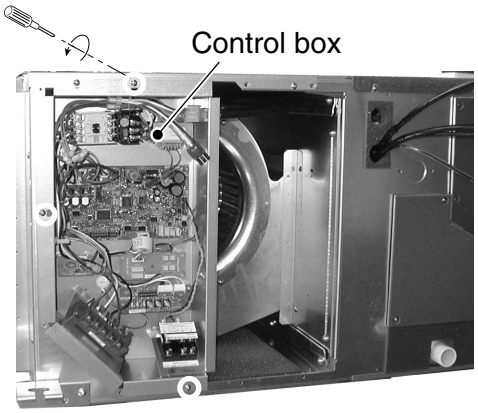
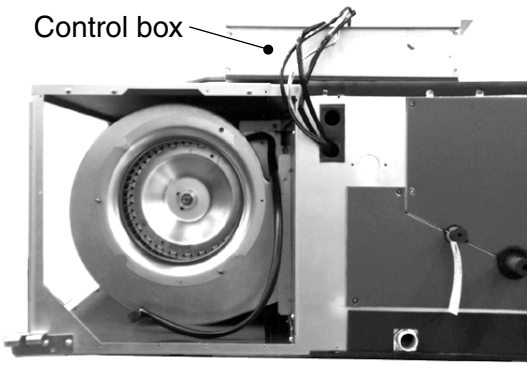


Fig.9

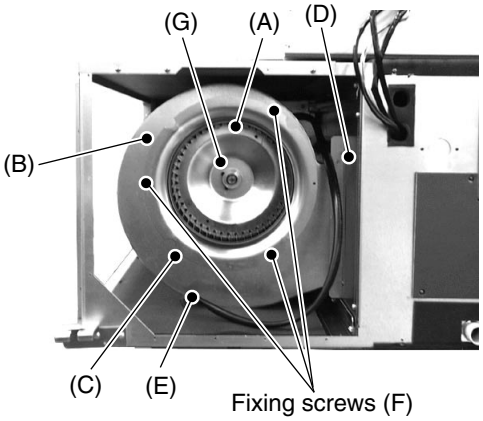


2.Removing the fan motor

*After the fan (A) ,the fan case (B) and the bell mouse (C) removed, motor can be pull with motor base and inner fan along rail.

(1) Remove the fixing screws (three) of the bell mouse (C), and remove the bell mouse (C). (Fig. 3)
(2) Loosen the setting screws (G) of the front fan , removed the fan.(Fig. 10)

Fig.10



Be careful on removing heavy parts.

OPERATING PROCEDURE

(3) After removing the fixing screws (H)(as shown models 36·48·54) of the front fan case(B) and remove the fan. Pull the fan case (B).

(4) Remove the fixing screws (K)(three) of the bell mouse (J) attached fan case (L), and remove the bell mouse (J). (Fig.12)

(5) Remove the fixing screws (four) of the motor base(D).

Notice: It's necessary using the driver over 30cm length to remove the fixing screws (a) .
(Fixing screws are placed back)(Fig. 13)

(6) Slide the motor (M) with motor base (D) in direction of arrow ②. (Fig. 14)

Notice: It's not necessary removing the fan case (L).

PHOTOS

Fig.11

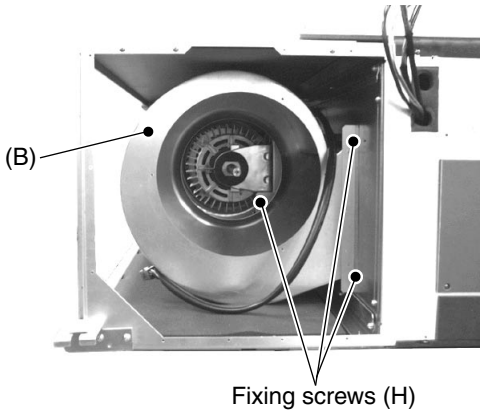


Fig.12

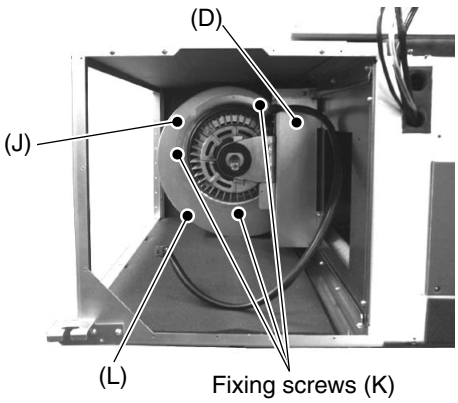


Fig.13

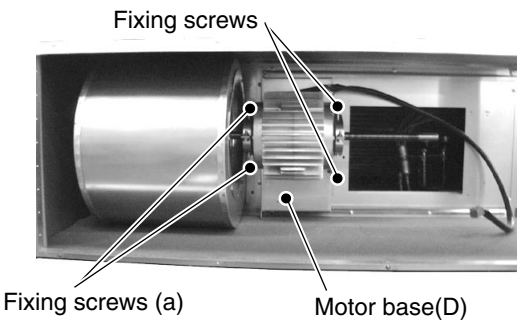


Fig.14

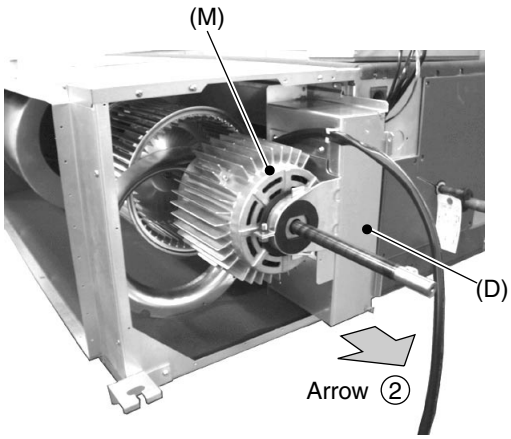
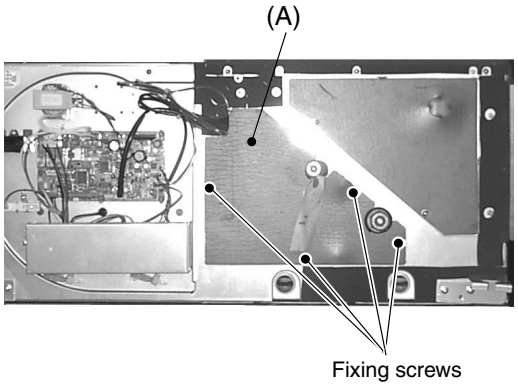
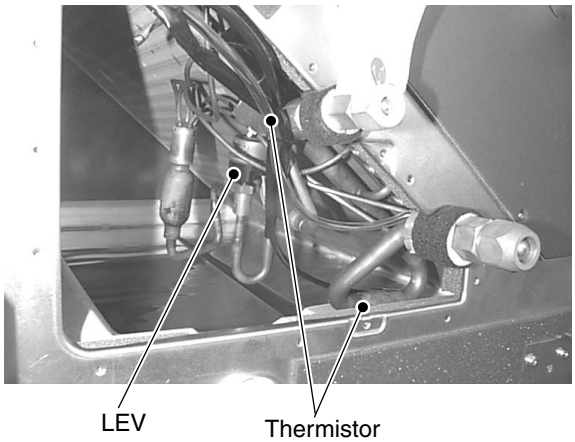
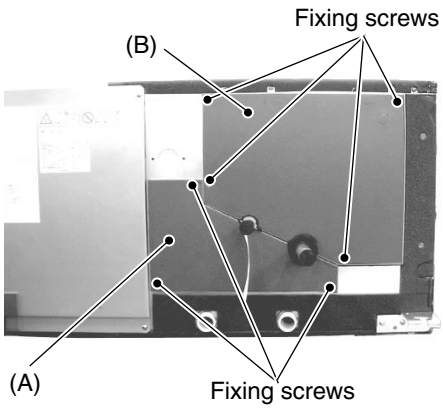
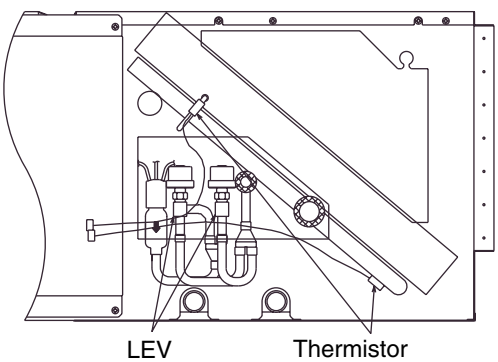


Fig.15

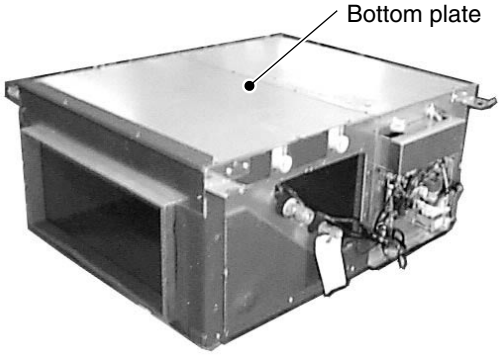
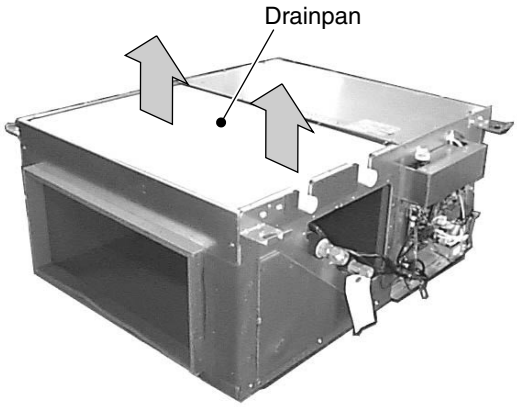
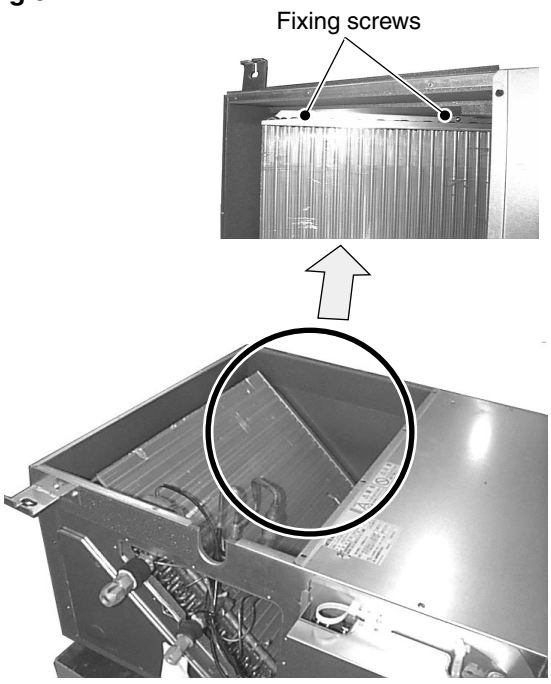
8-3. LEV,THERMISTOR (Liquid/Gas piping temperature detection)

Be careful on removing heavy parts.

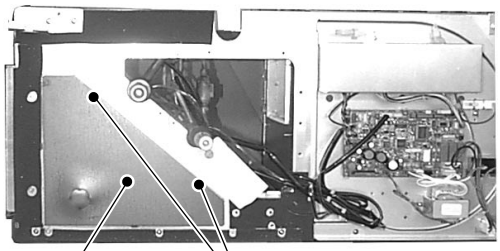
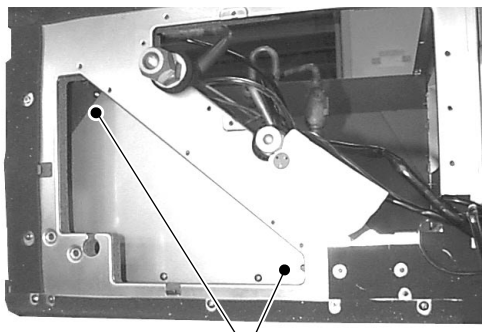
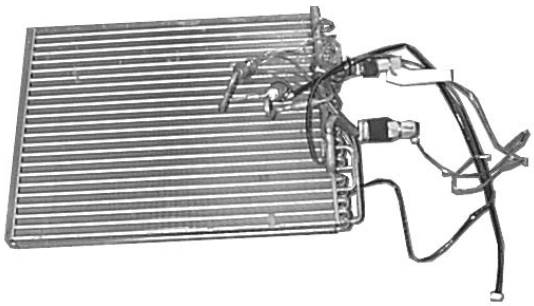
OPERATING PROCEDURE	PHOTOS
Models 15~54 **1.Removing the LEV.** (1) Remove the control box cover with procedure 8-1. (2) Remove the fixing screws (four) of the heat exchanger cover (A), and remove the cover (A).(Fig. 1) (3) Remove the LEV driving motor with a double spanner.(Fig. 2) **2.Removing the thermistors.** (1) Remove the thermistors from the thermistor holders which are installed on the piping.(Fig. 2) (liquid piping : fine piping , gas piping : thick piping)	**Fig.1**  **Fig.2** 
Models 72·96 **1.Removing the LEV. (These models have 2 LEV)** (1) Remove the fixing screws (three) of the heat exchanger cover (A), and remove the cover (A). (2) Remove the fixing screws (four) of the maintenance cover (B), and remove the cover (B).(Fig. 3) (3) Remove the LEV driving motor with a double spanner.(Fig. 4) **2.Removing the thermistors.** (1) Remove the thermistors from the thermistor holders which are installed on the piping.(Fig. 4) (liquid piping : fine piping , gas piping : thick piping)	**Fig.3**  **Fig.4** 

8-4. HEAT EXCHANGER

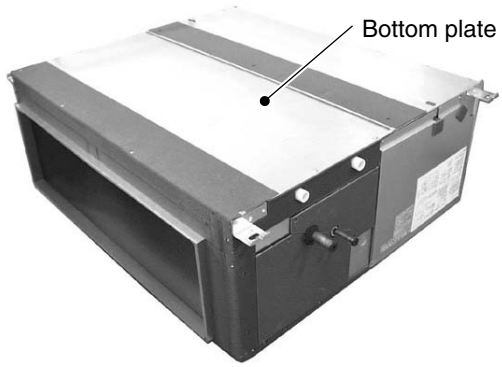
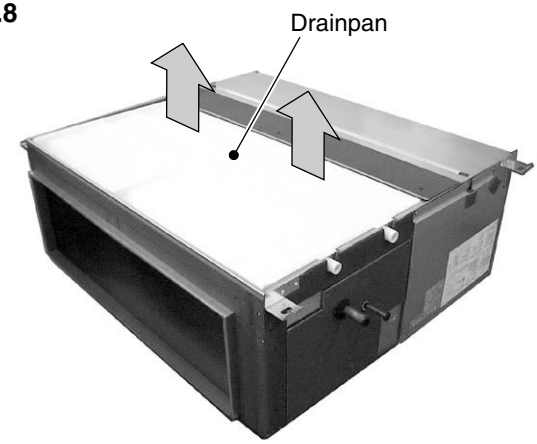
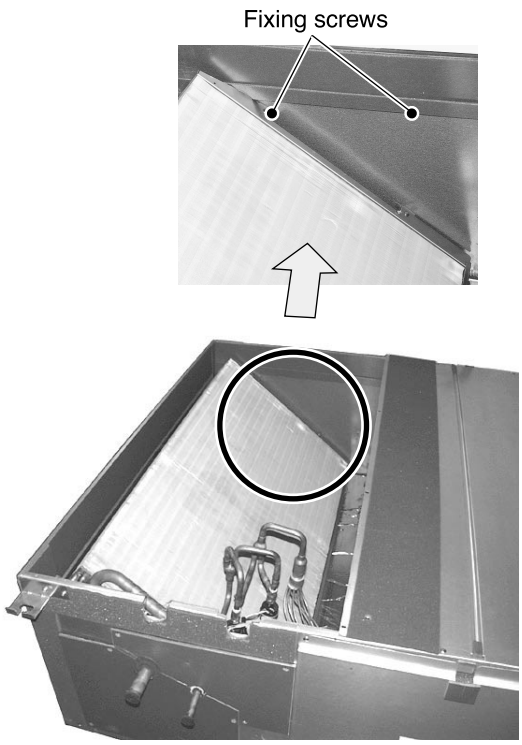
Be careful on removing heavy parts.

OPERATING PROCEDURE	PHOTOS
Models 15~54 **1.Removing the heat exchanger.** (1) Remove the heat exchanger cover with procedure 8-3-1. (2) Remove the bottom plate which is air outlet side.(fixing screws : ten) (Fig. 1) (3) Remove the drainpan.(Fig. 2)	**Fig.1**  **Fig.2**  **Fig.3** 

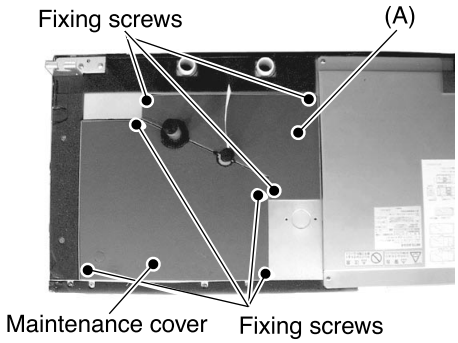
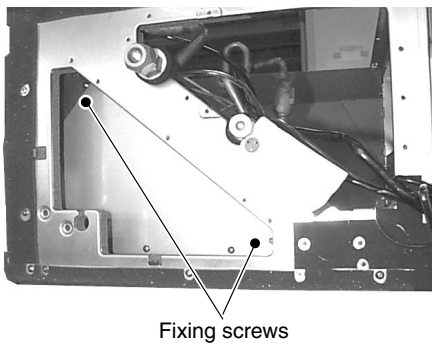
Be careful on removing heavy parts.

OPERATING PROCEDURE	PHOTOS
(4) Remove the maintenance cover.(fixing screws : two) (Fig. 4) (5) Remove the heat exchanger.(fixing screws : four) (Fig. 3,5) *Removerd heat exchanger is as shown Fig.6	**Fig.4**  Maintenance cover Fixing screws **Fig.5**  Fixing screws **Fig.6** 

Be careful on removing heavy parts.

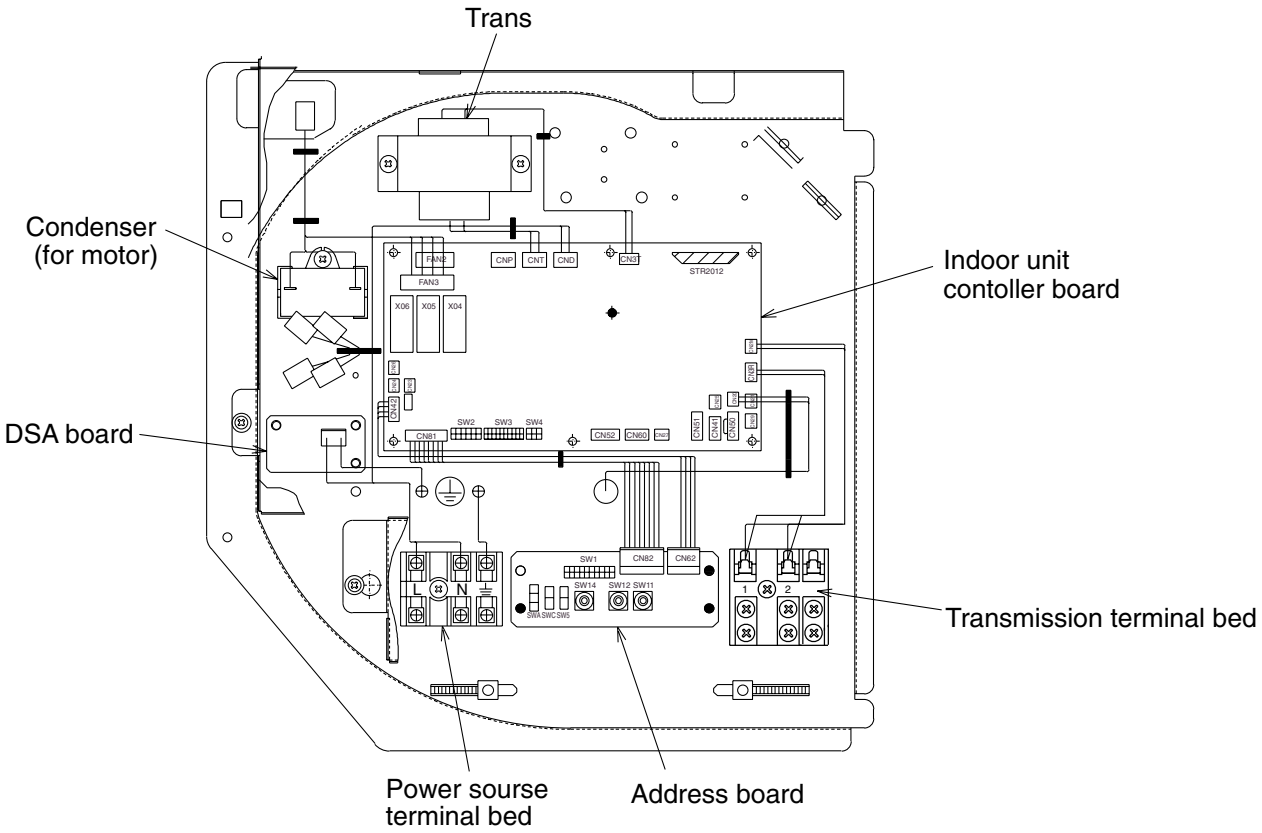
OPERATING PROCEDURE	PHOTOS
Models 72 · 96 **1.Removing the heat exchanger.** (1) Remove the refrigerant piping and drain hose from main unit.(Be care that water is not leaking from drain hose.) (2) Remove the power supply wire and the transmission line. (Make sure that power source is turning off.) (3) Pull down the main unit. (4) Turn over the main unit upside the bottom plate (5) Remove the bottom plate which is air outlet side.(fixing screws : fifteen) (Fig. 7) (6) Remove the drainpan.(Fig. 8)	**Fig.7**  **Fig.8**  **Fig.9** 

Be careful on removing heavy parts.

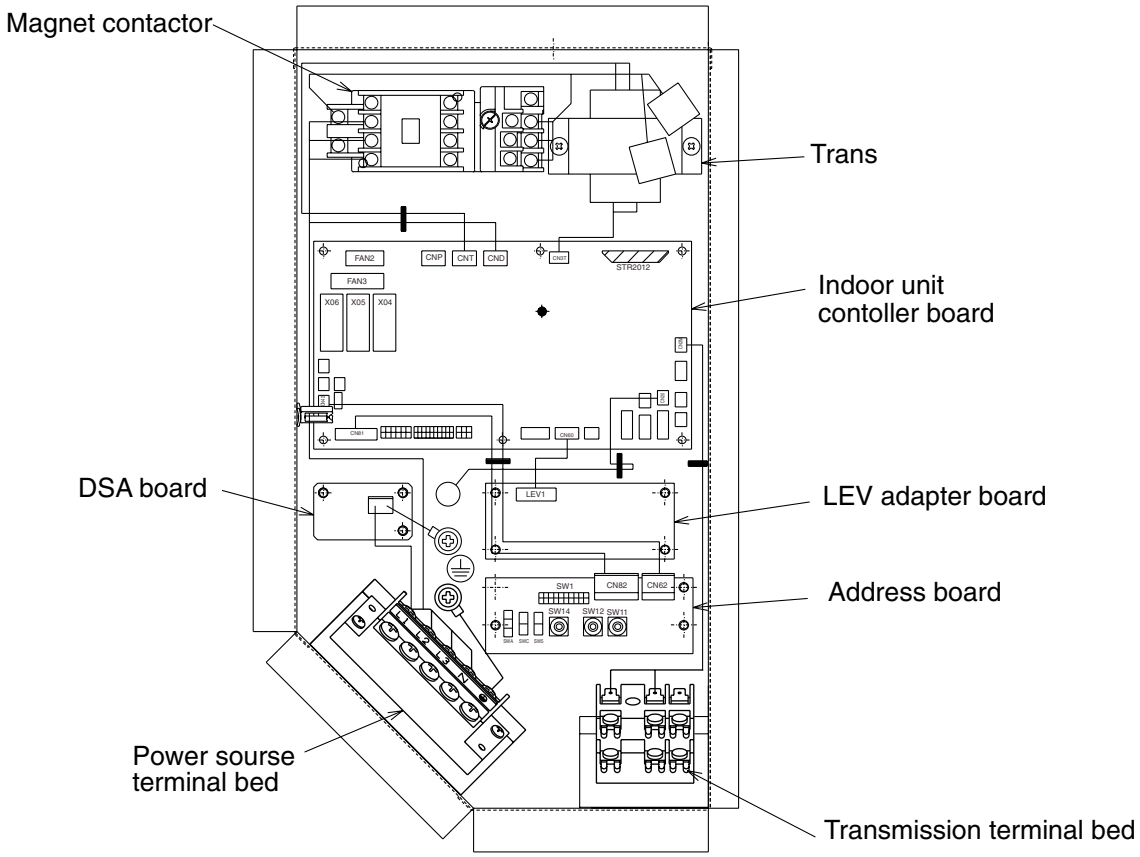
OPERATING PROCEDURE	PHOTOS
(7) Remove the fixing screws (three) of the heat exchanger cover, and remove the cover. Remove the fixing screws (four) of the maintenance cover, and remove the cover. (Fig. 10) (7) Remove the heat exchanger. Fixing screws(non-piping side) : two (Fig. 9) Fixing screws(piping side) : two (Fig. 11) *Removerd heat exchanger is as shown Fig.12	**Fig.10**  **Fig.11**  **Fig.12**

8-5. CONTROL BOX INSIDE LAYOUT

Models 15~54

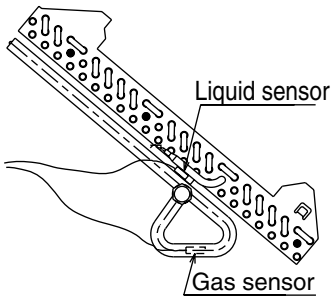


Models 72·96

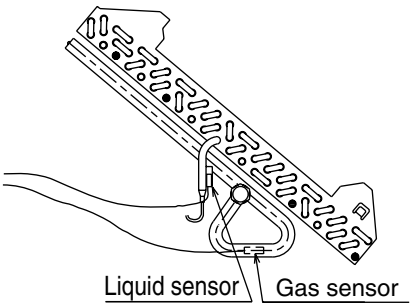


8-6. SENSOR POSITION

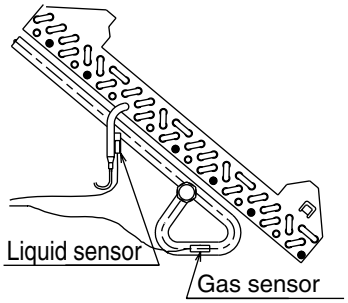
●**PEFY-P15NMHU-E**



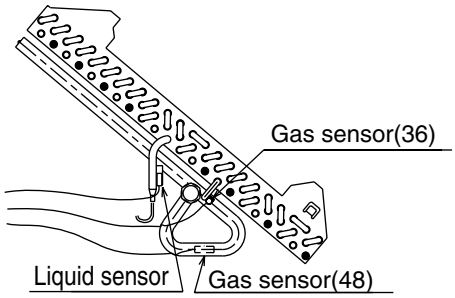
●**PEFY-P18· 24NMHU-E**



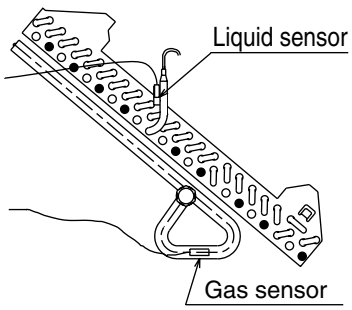
●**PEFY-P27· 30NMHU-E**



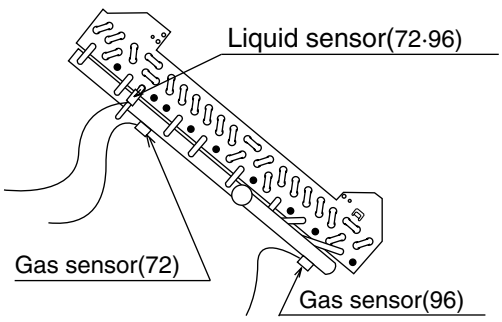
●**PEFY-P36 · 48NMHU-E**



●**PEFY-P54NMHU-E**



●**PEFY-P72 · 96NMHU-E**



MITSUBISHI ELECTRIC CORPORATION

Issued in Aug. 2005 HWE05120

New publication, effective Aug. 2005
Specifications subject to change without notice

HVAC Advanced Products Division

3400 Lawrenceville Suwanee Road • Suwanee, Georgia 30024
Toll Free: 800-433-4822 • Toll Free Fax: 800-889-9904
www.mrslim.com

Specifications are subject to change without notice.